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16. ABSTRACT

Introduction

Under Section 208 of Public Law 92-500 (Water Pollution Control Act Amendments), best management practices (BMPs) are being formulated under the direction of the State Water Resources Control Board (SWRCB) for the control of water pollution in California. The Department of Transportation (Caltrans) has worked closely with the SWRCB in developing BMPs for transportation-related activities that may affect water quality.

The BMPs presented in this document provide guidelines for all the functional areas of planning, designing, constructing, and maintaining a transportation system. The BMPs will be reviewed and updated as necessary to keep the program effective in maintaining minimal adverse effects on water quality. Caltrans will continue to coordinate these activities with the State Water Resources Control Board and its regional boards and other agencies that have a similar interest in this goal.

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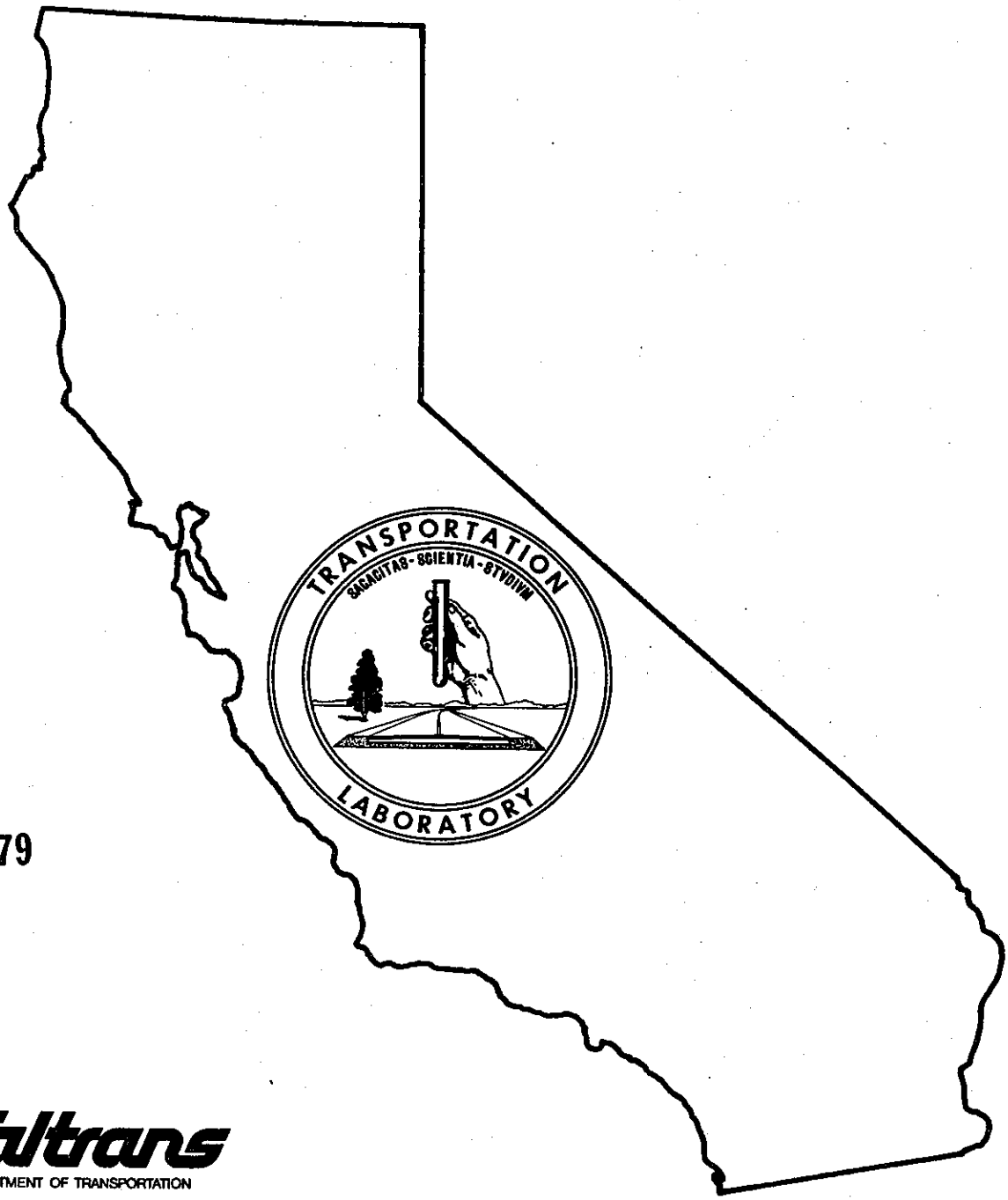

MAY 1979

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

79-27

BEST MANAGEMENT PRACTICES

FOR

CONTROL OF WATER POLLUTION

(Transportation Activities)

(Sec. 208 Public Law 92-500)

March 1979

California Department of Transportation

Adriana Gianturco, Director

Carl Forbes, Chief Engineer

F O R E W O R D

This document was prepared by the staff of Caltrans in consultation with members of the State Water Resources Control Board.

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INTRODUCTION

Under Section 208 of Public Law 92-500 (Water Pollution Control Act Amendments), best management practices (BMPs) are being formulated under the direction of the State Water Resources Control Board (SWRCB) for the control of water pollution in California. The Department of Transportation (Caltrans) has worked closely with the SWRCB in developing BMPs for transportation-related activities that may affect water quality.

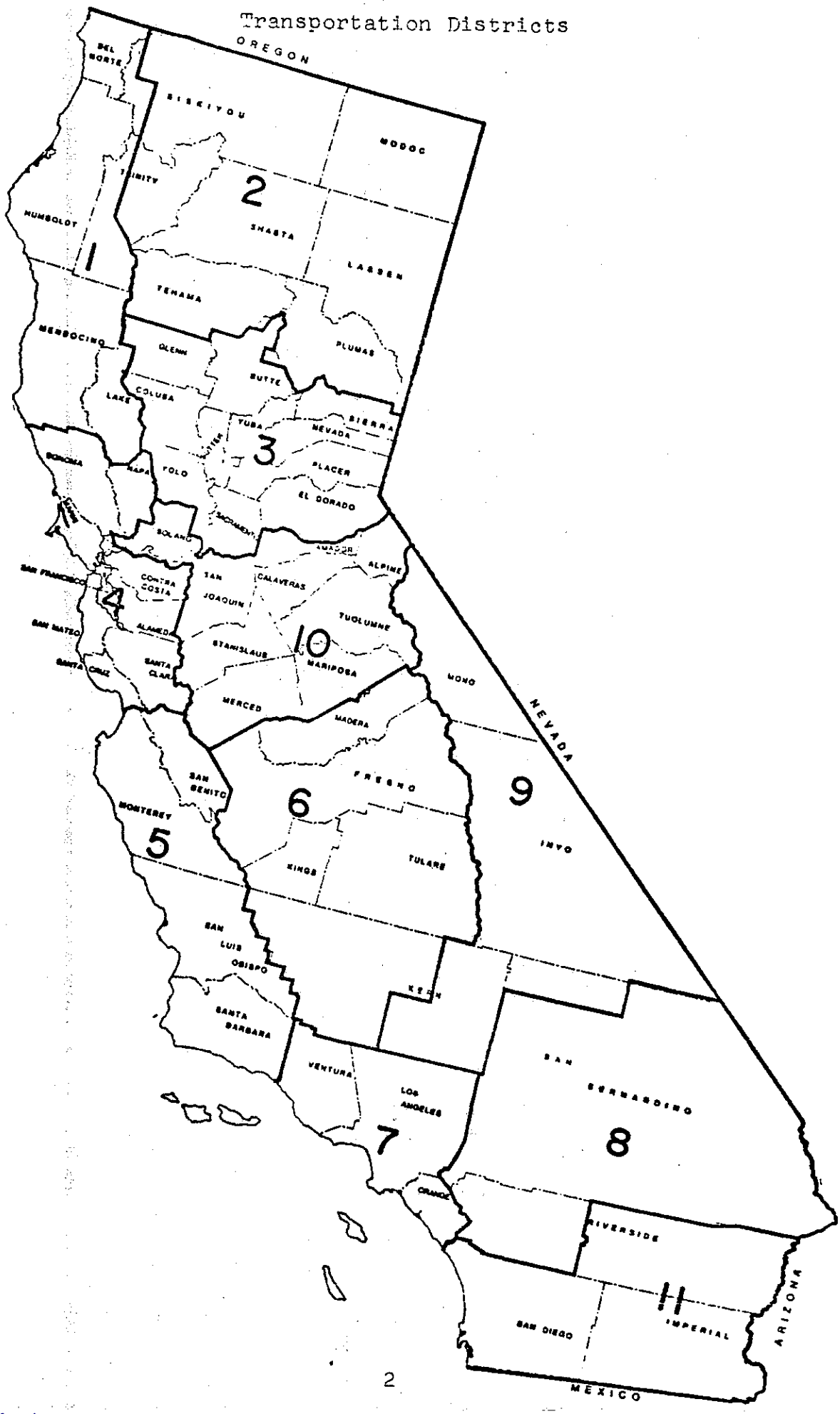
The BMPs presented in this document provide guidelines for all the functional areas of planning, designing, constructing, and maintaining a transportation system. The BMPs will be reviewed and updated as necessary to keep the program effective in maintaining minimal adverse effects on water quality. Caltrans will continue to coordinate these activities with the State Water Resources Control Board and its regional boards and other agencies that have a similar interest in this goal.

CALTRANS ORGANIZATIONAL STRUCTURE PERTAINING TO WATER QUALITY

The California Department of Transportation consists of a Headquarters staff centered in Sacramento and a District staff in each of the 11 Transportation Districts as shown in Figure 1. The California Transportation Commission gives direction to the organization's transportation program and develops a transportation plan for legislative consideration. Regional transportation plans become a part of the State plan.

Figure 1

Transportation Districts



Responsibility for environmental protection rests with the following Headquarters Units (see Figure 2):

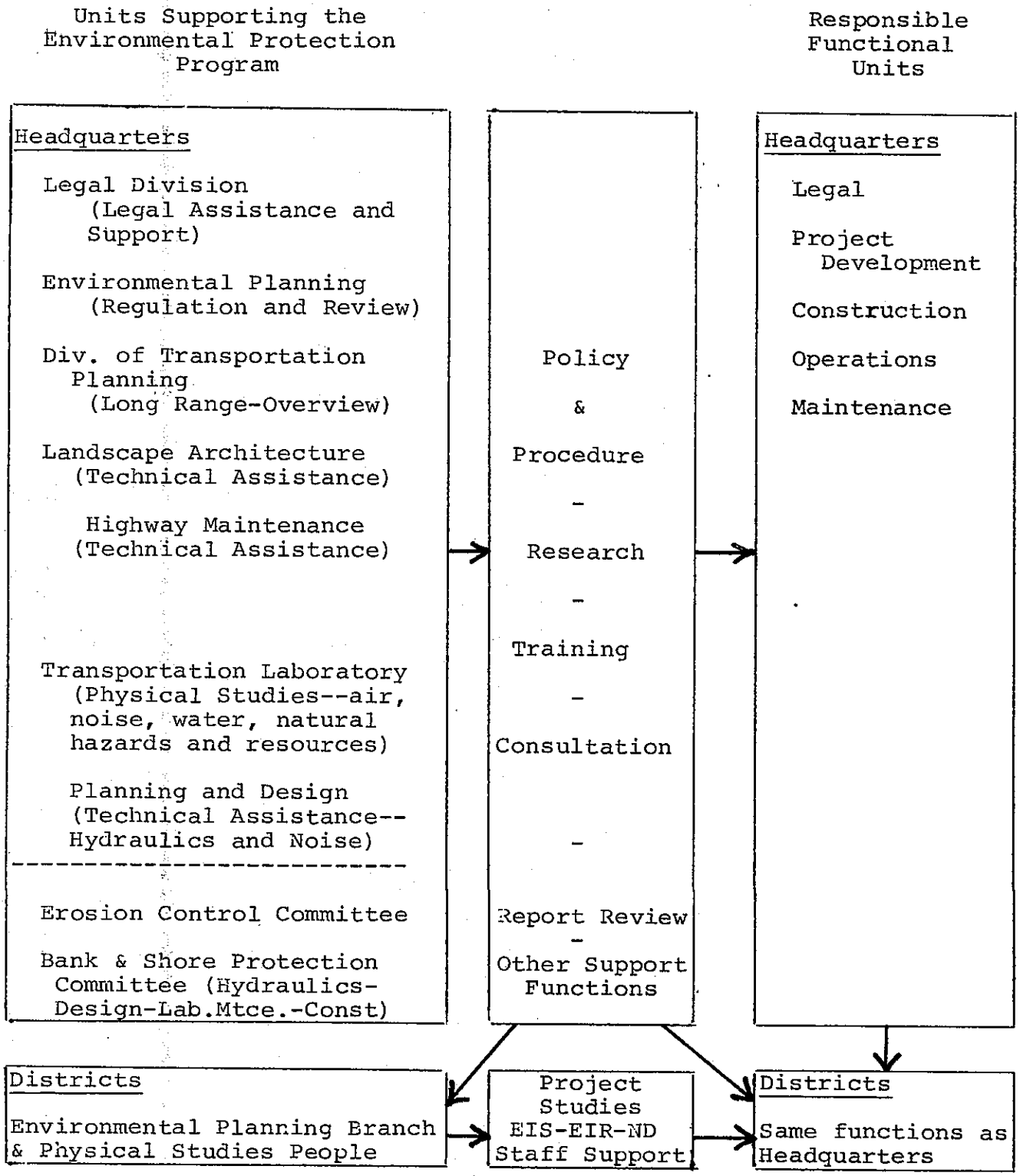
Unit	Responsibility
Legal Division	Legal assistance and support
Office of Environmental Planning	Regulation and review
Division of Transportation Planning	Long range overview
Office of Landscape Architecture	Technical assistance
Office of Highway Maintenance	Technical assistance
Office of Transportation Laboratory	Physical environmental studies
Office of Planning and Design	Technical assistance

The above units develop policy and procedures concerning water quality-related matters, conduct research and other special studies, present training for district environmental and technical staff, provide consultation services to the districts, and undertake other support functions for the environmental program.

The functional units that give guidance to the water quality program include Project Development, Construction, Operation, and Maintenance. These functional units carry out the policies and procedures, enforce specifications and permits, implement research findings, and utilize consultation services of environmental and technical staff specialists.

Figure 2

Caltrans Organizational Structure pertaining to Water Quality



The 11 Transportation Districts maintain similar functional units to carry out the transportation program within their respective jurisdictions. They also have established an Environmental Planning Branch for conducting, reporting, and processing environmentally related matters. This Branch coordinates closely with the Headquarters staff specialists in water quality-related matters.

The Transportation Districts plan, design, build, and maintain the State transportation system and subsequently have day to day contact with environmental aspects of the system. Implementation of the water quality control plan is effectuated by the operating field units.

TRANSPORTATION-RELATED WATER QUALITY IMPACTS

Potential water quality impacts related to transportation systems include soil erosion, drainage alterations, wetlands encroachments, material in runoff water, and accidental hazardous material spills. The potential impacts may be localized near a project or they could extend upstream or downstream some distance from the facility. Usually, impacts are associated with an identified beneficial water use or water quality standard established by a regulatory agency. The Basin Standards developed by the Regional Water Quality Control Boards serve as an indicator of potential impacts. Water quality discharge permits may also include limits of concentrations for various water quality parameters which can be used to indicate adverse conditions if they occur.

PROCEDURES TO PROTECT WATER (Best Management Practices)

The discussion on Procedures to Protect Water Quality centers around several actions that concurrently take place as part of the Caltrans environmental protection program. These activities constitute the Best Management Practices of the Department for the 208 Plan. The activities are those of Headquarters support, water quality studies for transportation projects, construction control procedures, operation and maintenance processes, and promulgations.

Support Given by Headquarters

The Headquarters staff provides support to the districts by: developing informational documents on water quality protection, presenting training, providing consultative services with staff specialists, serving in a review capacity for environmental documents and proposed plans and specifications, providing test procedures and necessary quality assurance programs, undertaking research to solve complex problems, and maintaining interagency coordination with Federal and State agencies. A fuller description of these activities is presented below.

A. Information Documents

Information documents are developed and issued according to prescribed regulatory requirements and as procedural quidelines for carrying out various aspects of the water

quality protection program. Examples of these materials include the Environmental Handbook that gives guidance on the preparation and processing of environmental documents; the Five Volume Water Quality Manual series for transportation that discusses the procedures for planning, conducting, analyzing, and reporting water quality studies; an Erosion Control Manual that depicts background information on erosion and sediment problems, and presents methods for controlling erosion; and the Bank and Shore Protection Manual that contains information on channel stability.

B. Training

Training courses are presented by staff specialists to equip district personnel with information related to water quality protection. Typical water quality-related training courses include:

4 1/2 days	Analysis of Water Quality for Highway Environmental Projects
2 1/2 days	Water Quality Laboratory Analysis for Highway Environmental Projects
2 1/2 days	Highway Slope Erosion Surveys
2 1/2 days	Biological Analysis of Water Quality for Transportation Projects

In addition to the formal training courses, staff specialists also present seminars to a variety of Caltrans personnel on subjects related to erosion control on construction, maintenance practices related to water quality, roadside rests maintenance procedures for sewage treatment, and the data management system for water quality information. These seminars are quite flexibile and are designed to accommodate any time frame from one hour to one day and can be adjusted to fit audiences ranging from very technical to management. A survey of district personnel is made annually to identify training needs in these areas and appropriate courses are then scheduled. In cases where a limited number of individuals need training, a special seminar or on-the-job training (OJT) may be scheduled.

C. Consultation

The Headquarters staff maintains specialists in hydrology, erosion and sedimentation, aquatic biology, water quality engineering, and water chemistry. These individuals are available to all the transportation districts to assist on water quality studies, advise on techniques, review materials and recommend courses of action. Most districts frequently use staff specialists on the more difficult water quality problems associated with transportation projects. The Headquarters units view consultative services to the districts as a very high priority item. Other work is normally set aside to assist on a district request. Where other specialists are needed that are not on the Caltrans

staff, arrangements are made with universities, governmental agencies, or private consultants to obtain the necessary professional skills.

D. Review

Water quality reports are normally prepared for transportation projects as a part of the environmental document. These technical reports are circulated to Headquarters staff specialists for review. Comments are made to clarify confusing points in the report, areas of omission, or procedures utilized. The districts have responsibility for incorporating comments and making any changes to the document. Plans and specifications (PS & Es) are also reviewed by water quality specialists. Erosion control items are especially scrutinized for effectiveness in doing the proper job.

E. Test Procedures and Quality Assurance

Chemical Testing Procedures are developed for all routine water testing (pH, turbidity, specific conductivity, dissolved oxygen, residue, etc.) to be performed by approved district laboratories. The selection of parameters to be tested for individual projects is based on a water quality reconnaissance survey, the beneficial uses of the water, and consultation with other agencies such as the Regional Water Quality Control Board and Department of Fish and Game. The test methods are based on authorized methods as denoted by the U.S. Environmental Protection Agency and then published

in the Federal Register. The methods utilize procedures in "Standard Methods for the Examination of Water and Wastewater", EPA, "Methods For Chemical Analysis of Water and Wastes", The American Society for Testing and Materials, "D-31 Water", and the U.S. Geological Survey, "Methods for Collection and Analysis of Water Samples for Dissolved Minerals and Gases".

Water testing laboratories are reviewed and receive approval from the California Department of Health for testing specified constituents in water. Each lab participates in the Quality Assurance Program (QAP) of Caltrans to insure high quality data. Basically, the QAP operates by sending a water sample to each water testing laboratory and requesting their testing of the sample. Results are checked against the known values and with other laboratory results. Problem areas are investigated and corrected. Chemists at the Transportation Laboratory are available to assist districts where needed. The Caltrans QAP has been approved by the Department of Health.

F. Research

Research is conducted in several areas of water quality to develop techniques for identifying problems, provide solutions for problems, and study the interaction of water quality variables for alternative solutions to complex situations. Water quality research has focused on important areas such as erosion control (both temporary and long-term); revegetation with grasses, bushes, and trees; deicing salt impacts on

terrestrial vegetation and aquatic resources; constituents in pavement runoff waters; and biological control. Most Caltrans research is funded on a participating basis with the Federal Highway Administration. In a few cases, research may be funded entirely by Caltrans where the nature of the study does not have nationwide application.

Research projects are developed to meet specific needs of districts and problems identified by others. A Headquarters Research Committee reviews all proposed research and gives approval before initiation of the project.

To insure implementation of research findings and to help guide the study, research coordinators are assigned from various offices such as Design, Construction, Maintenance, Landscape, etc. These individuals meet periodically with the researchers, review progress reports and study reports, and are responsible for implementation of findings within their particular functional area. Research Quarterly Progress Reports are prepared by the researchers to document progress on the study.

Normally, a final research report is prepared that lists the study objectives, findings and conclusions, recommendations, and has sections on implementation, research procedure, analysis of data, and results.

Research reports are distributed to all the Caltrans districts, State Libraries, and the Federal Highway Administration. Interested individuals, agencies, and local entities frequently receive reports of interest.

G. Interagency Coordination and Cooperation

Caltrans maintains contact with other state agencies in order to improve the flow of information relating to transportation proposals and environmental factors. Caltrans is a member of the Interagency Programming Committee (IPC) that was established by the State Water Resources Control Board to coordinate water quality studies in California as required by the State Porter-Cologne Water Quality Act. All proposed studies are submitted to IPC for review and study findings are made available to IPC member agencies.

Frequent contact is made with the Regional Water Quality Control Boards for review of proposed projects and to obtain necessary discharge permits. Likewise, the Department of Fish and Game participates in project reviews for those jobs that may involve interaction with streams, lakes, and estuaries.

Identification of problem areas on existing roadways are brought to the attention of each Caltrans District through contact with other Federal, State and local agencies. Appropriate steps are taken by the District to correct problem areas.

Seminars and field reviews of study sites or projects are periodically conducted in cooperation with local, State and Federal agencies. An example of field tours and seminars is the Lake Tahoe Erosion Symposium and Tour in 1977 sponsored by Caltrans in cooperation with the University of California (Davis), U.S. Soil Conservation Service, State Water Resources Control Board, Nevada Highway Department and the Tahoe Regional Planning Agency. The tour included review of erosion control experimental sites located throughout the Tahoe Basin. Similar tours in that area have been conducted since 1971. Another example of coordination with other agencies is the deicing salt study work. Annual meetings are held at U.C. Davis with interested agencies attending to get firsthand information on the study.

Materials that have been prepared for Caltrans' use are also available to others. For example, a 16mm color film on the technique of using fiberglass roving with vegetation to control erosion of ditches, has been shown to State and local government agencies throughout the State. Some local entities have purchased a copy of the film for their use. The Federal Highway Administration is also using the film for presentations at workshops in other states on controlling erosion.

Caltrans continually strives to make information developed during the course of its work available to all interested local, State and Federal agencies. Districts maintain close lines of communication with regional boards and local

governmental agencies. Similarly, information from others is made available to Caltrans operating units.

Other contacts by Caltrans come about by membership on technical committees of organizations and Federal advisory committees. Caltrans has representatives on the Transportation Research Board of the National Academy of Sciences, Committee D-19 (Water) of the American Society for Testing and Materials, and the Technical Advisory Committee for FHWA on Demonstration Project No. 43 Water Quality.

Water Quality Studies

Water quality studies and the subsequent field programs can be separated into several types depending on the functional level to which they apply and the nature of the contemplated work. The three basic types of studies include: 1) system planning, 2) project level (location and design), and 3) construction.

A. System Planning

At the system planning level, the study emphasis is on broad-scale water quality problems. It is important to identify the various water quality hazards and problems according to geographic location and temporal variability. Results of a study at this level must be capable of application to the three sets of alternatives: 1) the spatial set of alternatives, i.e., what are the possible alternate

locations for elements of the system; 2) the modal set of alternatives; i.e., what mode could be selected for each element; and 3) the temporal set of alternatives; i.e., what are the possible alternate times when elements of the system can be brought to fruition?

A study to provide results applicable to these alternatives must center on regional variation in such factors as erodibility, hydrology, ground water hydrology, land use, ground cover, and existing water quality.

Data that are collected by other agencies during the course of routine monitoring are utilized in obtaining a baseline for comparing potential impacts. The computer data base system, Water Data Information System (WDIS), maintained by the Department of Water Resources, and the conversion to the U.S. Environmental Protection Agency system called STORET provides much of the needed information. Additional data may be provided through WATSTORE maintained by the U.S. Geological Survey. Where data are lacking, a field sampling program may be implemented.

In the system planning study, care must be taken to avoid taking data, or using data, that are heavily site-dependent. Much data exist that are source oriented for a particular reason. In the system level study, while it is important to locate these specific problem areas, it is more important to look at basin problems or stream problems as a whole. Other agencies are consulted in regard to analysis of data and assessing potential impacts.

B. Project Level

Studies at the project level can be quite different, depending on the nature of the project. They can be separated, however, according to basic differences: 1) those projects which do not encroach uponan aquatic feature (includes flood plains) and differ mainly in terms of rural or urban location, and 2) those projects which do encroach upon an aquatic feature.

Information provided from these studies must be applicable to a decision among alternatives at the project level. The typical sets of alternatives at this level are: 1) the set of alternatives dealing with geometric design, including cross section and profile, 2) the set of alternatives having to do with traffic volume--in a highway, the number of lanes provided, 3) the set of alternatives for traffic flow--in a highway, this is a function of the volume-capacity ratio, and 4) the set of alternatives for location. This set of alternatives differs from that for system planning in that a corridor has been chosen already and the location alternatives are now severely restricted by the limits of that corridor. Each alternative is studied in terms of potential impacts and possible mitigation. Guidelines for conducting these studies are contained in Reference 5.

Figure 3 displays the component parts of the procedure used for analyzing possible transportation system impacts on water quality. After examination of the sources and amounts of possible pollutants from the proposed facility and emission

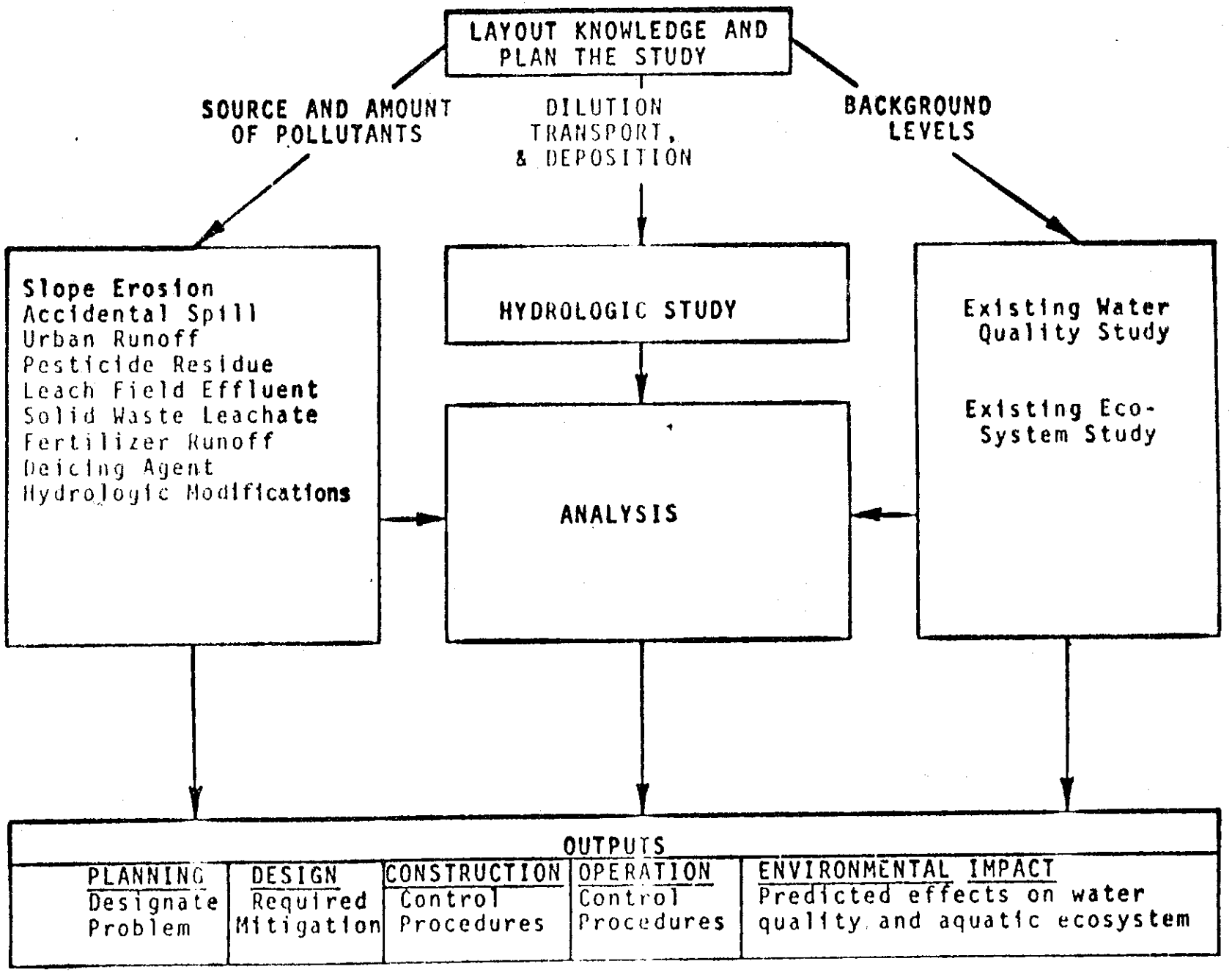


Fig. 3 A Procedure for Analyzing Transportation System Impact on Water Quality

from other nonproject sources, a dilution and transport analysis is performed to study the resultant water quality impact on downstream receptors.

Those projects which do not intrude upon an aquatic feature differ mainly in terms of rural and urban location. Planning a study in a rural location will usually have a major portion of program effort directed toward erosion and sedimentation problems. In cold climates with high water tables, emphasis may be directed at deicing salt runoff. Highway runoff in a rural situation is sometimes channeled by berms, or dikes, into a point discharge, but more often occurs as overland sheet flow.

Urban locations, in addition to erosion and sedimentation problems, usually require collection of highway runoff with subsequent discharge into some portion of the natural aquatic system. The fact that this discharge occurs only sporadically means that it concentrates an accumulation of pollutants into a slug flow when runoff occurs.

Planning an urban study requires a knowledge of the urban drainage system and the point where delivery to the natural aquatic system occurs. Urban hydrology is also substantially different with greatly lessened times of concentration as opposed to rural locations. Point source discharges in an urban locale are likely to be more complex, or of a wider variety than those in a rural setting, and show less seasonal variation. There will also be a difference in beneficial uses with greater emphasis on industrial service and process uses.

Projects which encroach upon an aquatic feature are unique in that hydrologic and hydraulic analyses are conducted not only with regard to transport and dilution of pollutants, but also from the standpoint of possible changes in dynamic equilibrium of the aquatic system. Flood plain encroachment also demands this type of analysis.

In studies concerning these types of projects, planning gives more weight to factors such as existing system hydraulics (stream regime and fluid mechanics), hydrology (especially flow frequency and low-high flow relationship), lateral and vertical stability at proposed stream crossings, effects of channel changes on hydraulics, and waterway constrictions from flood plain intrusion. Also, aquatic ecosystems receive more weight in these projects.

Mitigation measures are outlined that will protect the water quality. The long-term mitigation measures usually include features such as revegetation, soil stabilization, and structural erosion control measures in the project plans and specifications.

C. Construction

Water quality studies undertaken at the construction stage are almost always special purpose studies with a very narrow objective. As such, planning is usually straightforward. The studies are usually associated with a permit, such as issued by a Regional Water Quality Control Board, and often made a

condition of the permit. They are usually restricted to projects encroaching directly on a body of water such as a stream crossing or for facilities that parallel a stream course. The intent of most of these studies is to monitor and control the contractor's operations. For this reason, monitoring usually takes place upstream and downstream from the operation and control is usually predicated on exceeding some percentage of the upstream condition; i.e., 110 percent of upstream turbidity.

Construction Control

Construction of project facilities presents a critical time for potential water pollution. For this, Caltrans has initiated the requirement that contractors submit to the resident engineer, before starting work, a plan for water pollution control. This requirement is made a part of every project by incorporation in Caltrans' Standard Specifications, Section 7-1.01L Water Pollution. The requirements of the program to control water pollution effectively include the following:

> "Before starting any work on the project, the Contractor shall submit, for acceptance by the Engineer, a program to control water pollution effectively during construction of the project. Such program shall show the schedule for the erosion control work included in the contract and for all water pollution control measures which the Contractor proposes to take in connection with construction of the project to minimize the effects of his operations upon adjacent streams and other bodies of water."

Guidance on acceptability of the contractor's plan is available through Caltrans publications such as Reference 5 and other documents such as the National Cooperative Highway Research Program Report on Project 18, "Erosion Control on Highway Construction". Resident engineers and their representatives also participate in periodic workshops where evaluation of these plans is discussed. Caltrans specialists in water quality are available to assist the resident engineer in the review of the contractor's plan.

During the course of any construction project, operations may be temporarily halted if inadequate provision has been made for water quality protection. Remedial work may be required to correct any impacted areas, and a revised water pollution control plan submitted for approval before resumption of operations. Regulatory agencies may be consulted in regard to remedial work requirements.

Design plans designate features that must be incorporated into a project for water quality protection. The contractor is advised of these measures and they are installed as quickly as possible.

Specifications are prepared for each job to delineate activities and material requirements. For example, the maximum exposed area of erodible earth material at any one time in a given location is set at 750,000 square feet. Before additional acreage is opened up, either temporary or permanent erosion control measures must be accomplished. For environmentally

sensitive areas, the project special provisions may require installation of temporary measures for lesser exposed areas. The stipulation of these additional requirements would be developed during consultation with the regulatory agencies such as the Regional Water Quality Control Board and Department of Fish and Game. Other provisions include:

1. Where working areas encroach on live streams, barriers adequate to prevent the flow of muddy water into streams shall be constructed and maintained between working areas and streams and, during construction of such barriers, muddying of streams shall be held to a minimum.

2. Removal of material from beneath a flowing stream shall not be commenced until adequate means, such as a bypass channel, are provided to carry the stream, free from mud or silt, around the removal operations.

3. Should the contractor's operations require transportation of materials across live streams, such operations shall be conducted without muddying the stream. Mechanized equipment shall not be operated in the stream channels of such live streams except as may be necessary to construct crossings or barriers and fills at channel changes.

4. Water containing mud or silt from aggregate washing or other operations shall be treated by filtration, or retention in a settling pond, or ponds, adequate to prevent muddy water from entering live streams.

5. Oily or greasy substances originating from the contractor's operations shall not be allowed to enter or be placed where they will later enter a live stream.

6. Portland cement or fresh portland cement concrete shall not be allowed to enter flowing water of streams.

7. When operations are completed, the flow of the stream shall be returned as nearly as possible to a meandering thread without creating possible future bank erosion, and settling pond sites shall be graded so they will drain and will blend in with the surrounding terrain.

8. Material derived from roadway work shall not be deposited in a live stream channel where it could be washing away by high stream flows.

9. Where there is possible migration of anadromous fish in streams affected by construction on the project, the contractor shall conduct his operations so as to allow free passage of such migratory fish.

In addition to the Caltrans specifications, permits must be properly secured and adhered to. Section 5650 and 12015 of the Fish and Game Code must be complied with. Other State and Federal permit requirements include:

- Point source discharge of pollutants (with the exception of dredged or fill material) into a waterway is authorized by an NPDES (Section 402, PL 92-500) permit issued by a Regional Water Quality Control Board.

- Discharge of dredged or fill material into navigable waters is authorized by Section 404 (PL 92-500) and the permit is issued by the Corps of Engineers. Waste discharge requirements from a Regional Water Quality Control Board are required prior to obtaining necessary State certification under Section 401 of PL 92-500.

- Transport of dredged material for ocean dumping is authorized by Section 103 (PL 92-532) and the permit is issued by the Corps of Engineers.

- Obstruction, alteration, or improvement of any navigable water is authorized by permits under Section 10 of the Rivers and Harbors Act and is issued by the Corps of Engineers.

- Construction, modification, or removal of a bridge or causeway is cleared by permit issued by the Coast Guard under the authority of Section 9 of the 1899 Rivers and Harbors Act.

- Any discharger applying for a Federal permit under PL 92-500 is required by Section 401 to obtain State certification that the discharge will comply with Sections 301, 302, 306, and 307 of PL 92-500. These Sections deal with effluent water quality.

- Any applicant for a Federal permit or license is required by Section 307 (c)(3) of the Coastal Zone Management Act to furnish certification that the activity will comply with the State's Coastal Zone Management Program.

- Activities in any designated sanctuary are required by Section 302 of the Marine Protection, Research and Sanctuaries Act to provide certification of consistency with Title III of the Act and of compliance with regulations of the sanctuary.

- Federal agencies proposing to control or modify any body of water are required by Section 662 of the Fish and Wildlife Coordination Act to coordinate activities with the U.S. Fish and Wildlife Service and the State Department of Fish and Game.

Operation and Maintenance

The potential for water pollution to occur during the operation and maintenance phase of a transportation facility is ever present. Accidental chemical spills are not uncommon on traffic routes that carry toxic chemicals, fuels, and other substances. Maintenance personnel are equipped to handle emergency spill situations. A procedural manual has been developed by each District to standardize procedures. Details of the procedures that are followed are contained in these documents. The document is in conformity with the State Office of Emergency Services. In addition to concerns

of environmental protection, the health, safety and protection of the public is of prime concern. Other agencies or local entities may be requested to assist in emergency operations as outlined in the District procedural manual.

The Office of Maintenance carries out a program of roadside litter cleanup and street sweeping operations. This program is effective in preventing the flushing of undesirable materials into storm drains and drainage facilities.

Where slopes show evidence of erosion, slides and/or slipouts, remedial measures may be taken to stabilize the slope. The District Materials Engineer coordinates the acquisition of field data to develop a stabilization plan based on standard geotechnical engineering principles. Surface treatments are also planned to control erosion based on the advice of the District or Headquarters Landscape Design Office. Every effort is made to dispose of eroded soil, rock, and debris at approved dumping sites. Disposal of routine slope sediments within flood plains of defined water courses is not permitted. The Caltrans District Maintenance Engineer has a list of approved disposal sites which are environmentally satisfactory for use. These sites are selected with the advice and consent of other agencies.

Repair of channels and drainages is normally conducted during periods of low flow to prevent degradation of stream quality. Permits are usually required before the work is undertaken. Environmental staff specialists are available to assist in these operations.

Application of deicing salts during the winter months to all State highways and other facilities subjected to infrequent periods of snow and ice is a major responsibility of maintenance. Gradation specifications are prepared for the purchase of deicing salt so that the aquatic environment is protected. Special studies are being conducted on aquatic ecosystems in California that are subject to salt usage for ice control. Salt spreads are rigidly controlled by mechanical means.

Salt is always stored in overhead bins or inside sheds. The storage areas are carefully controlled to prevent runoff from these sites. Salt is spread through the use of a control mechanism on the spreader trucks that releases the salt or salt mixed with abrasives at a predetermined rate. This also allows the operator to apply salt at selected locations such as shady spots, grades, or dangerous curves. These efforts to control any pollution from deicing salt use continues to insure that the environment is protected.

Use of chemical fertilizers or pesticides is carefully controlled. Biological control is being used for some noxious weeds and insects. Studies continue with the Food and Agriculture Department, and the universities to find acceptable biological solutions to other pest problems. All rules and regulations of the Department of Food and Agriculture, the Department of Health, the Department of Industrial Relations, and other agencies are adhered to.

Promulgations

Because a large portion of the transportation program in California is supported by Federal tax dollars, the Federal Highway Administration administers the program according to Federal guidelines. The Federal-Aid Program Manual lists the necessary requirements that must be adhered to for environmental assessments and mitigation procedures for water quality protection. Periodically, memoranda are also issued by FHWA that stipulate additional requirements or discuss procedures to be followed.

Federal promulgations are translated into State guidelines by Headquarters staff for uniform administration throughout all the District operations. Policy and procedure memoranda are usually the vehicle used to accomplish this task. In some cases, memoranda may be issued in lieu of policy and procedure documents.

Examples of previously issued documents by Caltrans include CL 72-18 Water Pollution Control, DD 72-47 Control of Pesticide Usage, CL 72-5 Coordination of Erosion Control Activities, CL 73-13 Liaison With the State Reclamation Board, P 73-74 DOT Organization Responsibilities for Environmental Concerns, CL 72-72 Coordination With Department of Fish and Game, etc.

IMPLEMENTATION

To implement the Best Management Practices Water Pollution Control Program for Caltrans, a Memorandum of Understanding will be initiated between the State Water Resources Control Board and the Department of Transportation. The Memorandum of Understanding will designate Caltrans as responsible for the State road system. The State Water Resources Control Board will provide assistance in assessing problems and recommending corrective measures.

Districts may establish Memoranda of Understanding with local Resource Conservation Districts (RCD) and Regional Water Quality Control Boards to participate in remedial programs aimed at providing long-term solutions to slope erosion problems. The expertise of erosion control specialists of the RCDs, U.S. Soil Conservation Service, and other State and Federal agencies will be used. Headquarter's staff specialists will be used to help set up technical arrangements and review work plan proposals.

Any projects requiring participation of the Federal Highway Administration will be processed according to established guidelines for federal-aid projects. FHWA may be listed as a third party on interagency documents requiring Federal approval. In no case will less than FHWA requirements be adopted for federal-aid projects without prior approval.

To remain effective, the Caltrans Best Management Practices Program will be reviewed annually after the initial plan is approved by the State Water Resources Control Board and it becomes a part of the overall State program of water pollution control. The review will be carried out by Headquarters functional areas under the direction of the Deputy Director for Engineering and Operations. Modifications will be employed where deemed appropriate after consultation with the SWRCB. The districts will provide input to the review. The Director of Transportation will participate in coordination of the Department's program with the overall program of water pollution control in California.

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